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PATENT**REMARKS**

Claims 1-11 and 38-50 are currently pending. Claims 12-37 were previously withdrawn from consideration. Claim 6 was previously amended to recite "peroxide" anion which is used to generate and release ozone gas.

A. The Claimed Invention

The pending independent claims 1 and 8 of the present invention are composition claims directed to electromagnetic energy-controlled generation and release of a gas. The pending independent claims 39 and 46 are composition claims directed to the light activated photocatalytic-controlled generation and release of a gas. All claims not only involve, but require the activation of some form of electromagnetic energy catalyst (e.g., photocatalyst) to oxidize or react an anion to generate and release a gas.

As defined in the application, electromagnetic energy consists of an energy source that provides a photon having energy in excess of the band gap of the energy-activated catalyst (page 18, lines 32 - page 19, line 2 of the specification). Preferred electromagnetic energy sources are disclosed to be sunlight, fluorescent light, and ultraviolet light. It is believed that when exposed to electromagnetic energy, the catalyst absorbs a photon having energy in excess of the band gap. An electron is promoted from the valence band to the conduction surface of the energy-activated catalyst where they can react. An anion is oxidized by the activated catalyst surface when an electron is transferred from the anion to the valence band hole, forming the gas (page 11, lines 1-10).

B. Rejection under 35 U.S.C. §102(b) over Matsumoto et al. U.S. Patent No. 5,108,649 or Okuda et al. U.S. Patent No. 5,330,661 or Ringo U.S. Patent No. 5,008,096 or Schenck U.S. Patent No. 5,753,106

Reconsideration is respectfully requested of the rejection of claims 1-11 and 38-50 as being anticipated by Matsumoto et al. U.S. Patent No. 5,108,649 or Okuda et al.

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U.S. Patent No. 5,330,661 or Ringo U.S. Patent No. 5,008,096 or Schenck U.S. Patent No. 5,753,106. Matsumoto teaches a preserving agent, method and container for maintaining the freshness of fresh marine products. The preserving agent in Matsumoto is comprised of a salt, iron powder and an oxide. While Matsumoto describes deoxidizing marine products using the preserving agent, it does not describe the generation and release of a gas. Furthermore, Matsumoto fails to describe the activation of a catalyst by electromagnetic energy, and oxidation or reaction of anions to generate and release a gas as required in the present claims. Therefore, claims 1-11 and 38-50 are not anticipated by Matsumoto.

Okuda teaches a process and apparatus for treating water contaminated with a toxic organochlorine solvent. More specifically, Okuda describes decomposition of organochlorine solvents in the presence of hydrogen peroxide or ozone and UV irradiation to form carbon dioxide, water, hydrochloric acid, etc. (col. 3, lines 40 - 47). **Carbon dioxide is generated by the decomposition of organic matter, not by the oxidation or reaction of anions to generate a gas.** Such decomposition reactions were addressed by applicants in the background of the subject application at p. 1, lines 20-29, wherein it is stated that "[c]arbon dioxide is generated by the decomposition of organic matter, not by the oxidation of anions." Okuda does not describe the reaction of anions to generate and release a gas as claimed. As a result, claims 1-11 and 38-50 are not anticipated by Okuda.

Ringo teaches a method for enhancing generation of chlorine dioxide by contacting an aqueous medium containing a chlorine dioxide precursor (e.g., sodium chlorite) with an amount of chlorine gas, sodium hypochlorite, or hydrochloric acid which reacts with a catalytic amount of a transition metal. **Chlorine dioxide is said to be generated in response to increased acidity (col. 3, lines 6-8), not through activation with electromagnetic energy.** As with the references above, Ringo does not describe or teach the activation of the catalyst by electromagnetic energy. Therefore, claims 1-11 and 38-50 are not anticipated by Ringo.

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Schenck teaches a method of oxidative purification of a medium contains contaminants in the form of an oxidizable carbon compound. The contaminants are decomposed according to a series of reactions as described at cols. 2-3 of the patent. **As with Okuda, a gas is generated by the decomposition of organic matter, not by the oxidation or reaction of anions to generate a gas.** Therefore, claims 1-11 and 38-50 are not anticipated by Schenck.

C. Paragraphs 4 - 7 of Pending Action

Paragraphs 4-7 of the Pending Action simply repeat the Office's assertions from paragraphs 12-15 of the Office Action dated September 16, 2003. Applicant thoroughly responded to these assertions in Amendment A, incorporate such response by reference herein, and respectfully request reconsideration of these rejections. As stated in Amendment A, the "capable of" statements in the present claims are important functional limitations which define the scope of the invention. To a person of ordinary skill in the art, the claimed catalysts in the present invention are limited to those "capable of being activated by electromagnetic energy" or "capable of being activated by light." As Applicant pointed out in Amendment A, a functional limitation is "perfectly acceptable" as long as it sets "definite boundaries on the patent protection sought." See MPEP 2173.05(g) and *In re Barr*, 444 F.2d 588, 595 (CCPA 1971). In the present Action, the Office asserts that it has met its burden under MPEP 2173.05, and that the "problem" is that Applicant "has misconstrued the scope of their claimed invention."

According to the Office, "no claims have any requirement that electromagnetic energy is actually being applied to the claimed composition." The Office goes on to state that all Applicant's claims require is that the composition be "capable" of generating a gas when the catalyst is activated by electromagnetic energy. However, the claims of the present invention are for "[a] composition for *electromagnetic energy-controlled generation* and release of a gas." While the composition contains a catalyst capable of being activated by electromagnetic energy, the composition itself must be for

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an *electromagnetic energy-controlled* generation and release of a gas. In general, a preamble limits the claimed invention if it recites essential structure or steps or is necessary to give life, meaning, and vitality to the claims. *Catalina Mktg. Intl. b. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002). Clear reliance on the preamble during prosecution to distinguish the claimed invention from the prior art can indicate that the preamble is a claim limitation because the preamble is used to define the claimed invention. *Id.* In this case, the preamble helps to define the claimed invention and is a limitation of the claims that is not described or suggested in the cited references.

Also, the Office incorrectly asserts that Applicant has admitted that the Yoshida reference could be subject to an electromagnetic energy limitation. Yoshida '352 teaches an **oxygen-generating** material. The fact that the decomposition described by Yoshida would produce ozone if it were energy activated, shows that Yoshida does not teach or even suggest the possibility of energy activation.

As for Hancock, even if the Office discredits applicant's argument that Hancock teaches away from the claimed invention, the claims are not anticipated by Hancock because Hancock fails to describe anions capable of generating a gas or a gas-releasing composition. If the anions described by Hancock were energy activated so that they oxidized or reacted to form a gas, as in the present claims, then the peroxide would form ozone, not oxygen, and the hypochlorite would form chlorine, not carbon dioxide.

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PATENT**CONCLUSION**

In view of the foregoing, favorable reconsideration of pending claims 1-11 and 38-50 is respectfully requested.

Applicants request an extension of time to and including December 10, 2004 for filing a response to the Office action. The Commissioner is requested to charge the applicable extension fee of \$60.00 to Deposit Account No. 19-1345.

Respectfully submitted,



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